



# pro<sup>2</sup> Network+ Advisory Board Agenda

27 October 2025, 3-4:30pm | Microsoft Teams

## Attendees:

Giulia Pratico, Western Gateway Team Manager, Innovate UK Business Growth.

Jim Davison, Region Director, Make UK.

Tim Minshall, Dr John C Taylor Professor of Innovation and Head of the Institute for Manufacturing at the University of Cambridge, **Chair**.

Lars Erik Holmquist, Professor of Design and Innovation, Nottingham Trent University.

Maria Galvez Trigo, Assistant Professor in the School of Computer Science and Informatics, Cardiff University.

Maura Lydon, pro<sup>2</sup> Network+ Senior Administrator, **Secretary**.

Mike Fraser, Professor of Human-Computer Interaction and Head of Department of Computer Science, University of Bristol. pro<sup>2</sup> Network+ Steering Group Principal Investigator.

Sarah Hughes, pro<sup>2</sup> Network+ Manager.

Steve Hodges, Professor in Computing and Digital Systems. pro<sup>2</sup> Network+ Steering Group Co-Lead.

## Apologies:

Laura McDonnell, Senior Portfolio Manager, EPSRC.

Sarah Fawcett, Business Director Europe, Semi Town.

Stephen Chadwick, EVP & President EMEA, Hexagon Manufacturing Intelligence.

Rory Clark, pro<sup>2</sup> Network+ Research Associate, University of Bristol.

## Agenda

| Item | Title  | Allocated Time | Lead |
|------|--|----------------|------|
| 1    | <p>Welcome and review of actions from the last meeting:</p> <p>Actions:</p> <ul style="list-style-type: none"><li>• AB to share any other ideas for promotion of the Residency Scheme, ideally for avenues where they would be likely to see and pay attention to an advertisement like this.</li><li>• pro<sup>2</sup> team to forward an email promoting the scheme to LEH for dissemination via the Sketching in Hardware and CHI-announcement mailing lists.</li><li>• SG to make contact with Mike Jones of the Shoestring Project</li><li>• AB to assist with the promotion of the summer school by sharing it with their contacts and advising the network on good avenues for advertising.</li></ul> | 3-3:20         | TM   |

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|   | <ul style="list-style-type: none"> <li>• SHo to connect with the ElecTech cluster about promoting the summer school.</li> <li>• JD to establish an introduction between the team he worked with to identify companies by industry and SHu and ML, CCing SHo.</li> <li>• TM has sent an email to his own contacts at Cambridge about the summer school and will forward it to others as well. The pro<sup>2</sup> team can check in with TM about the response to this.</li> <li>• SG availability to attend the Smart Manufacturing Week event to be discussed at the next SG meeting.</li> <li>• SHo and/or RC to connect with members of the Manufacturing on a Shoestring project to discuss their closely related research interests.</li> <li>• SG and/or RC to identify researchers working on the issues of sustainability and e-waste, and determine whether their work aligns with that of the network. This could serve as a starting point for future collaboration or as a resource for feedback on sustainability questions.</li> <li>• SG to consider preparing a statement in future explaining why they did or did not carry out activities around environmental sustainability.</li> <li>• ML to schedule the next meeting of the AB.</li> </ul> |           |          |
| 2 | <p>Update on what has been done since the last meeting and what is next for pro<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Theme 2 project update: MakeDevice</li> <li>• Theme 1 project engagement</li> <li>• Summer school 2025 and 2026</li> <li>• Pre-CHI event and Open Source Hardware Summit</li> <li>• BOMNADO</li> <li>• Residency scheme update</li> <li>• Joint call with the DICE network+</li> <li>• Away day - funding focus</li> <li>• Staffing updates</li> </ul>   | 3:20-4:10 | SHo + MF |
| 3 | Research Associate work programme overview  | 4:10-4:20 | RC       |
| 4 | <p>AOB</p> <ul style="list-style-type: none"> <li>• In person meeting in April</li> </ul>   | 4:20-4:30 | TM       |

## Minutes

| Item | Title   | Deadline | Responsible |
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| 1    | <p>Welcome and review of actions from the last meeting:</p> <p>Actions:</p> <ul style="list-style-type: none"> <li>AB to share any other ideas for promotion of the Residency Scheme, ideally for avenues where they would be likely to see and pay attention to an advertisement like this. <ul style="list-style-type: none"> <li>Completed.</li> </ul> </li> <li>pro² team to forward an email promoting the scheme to LEH for dissemination via the Sketching in Hardware and CHI-announcement mailing lists. <ul style="list-style-type: none"> <li>Completed.</li> </ul> </li> <li>SG to make contact with Mike Jones of the Shoestring Project. <ul style="list-style-type: none"> <li>In progress. Mike's colleague has been contacted, but SHo said there was difficulty scheduling a date to meet. TM recommended going directly to Mike Jones in order to connect with the Shoestring Project and has shared Mike's email address with SHo. <b>SHo to contact Mike Jones by email to set up a meeting.</b></li> </ul> </li> <li>AB to assist with the promotion of the summer school by sharing it with their contacts and advising the network on good avenues for advertising. <ul style="list-style-type: none"> <li>Completed.</li> </ul> </li> <li>SHo to connect with the ElecTech cluster about promoting the summer school. <ul style="list-style-type: none"> <li>Completed.</li> </ul> </li> <li>JD to establish an introduction between the team he worked with to identify companies by industry and SHu and ML, CCing SHo. <ul style="list-style-type: none"> <li>Incomplete. The industry event planned for autumn 2025 is not going forward. pro² Management Team to contact</li> </ul> </li> </ul> | 28/11/25 | SHo         |

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|   | <p>JD if this introduction is needed in future.</p> <ul style="list-style-type: none"> <li>• TM has sent an email to his own contacts at Cambridge about the summer school and will forward it to others as well. The pro<sup>2</sup> team can check in with TM about the response to this. <ul style="list-style-type: none"> <li>○ Complete.</li> </ul> </li> <li>• SG availability to attend the Smart Manufacturing Week event to be discussed at the next SG meeting. <ul style="list-style-type: none"> <li>○ Complete. pro<sup>2</sup> did not exhibit at the event but MF attended. He found it useful for making connections and advertising the summer school.</li> </ul> </li> <li>• SHo and/or RC to connect with members of the Manufacturing on a Shoestring project to discuss their closely related research interests. <ul style="list-style-type: none"> <li>○ In progress. See related action above.</li> </ul> </li> <li>• SG and/or RC to identify researchers working on the issues of sustainability and e-waste, and determine whether their work aligns with that of the network. This could serve as a starting point for future collaboration or as a resource for feedback on sustainability questions. <ul style="list-style-type: none"> <li>○ In progress. There will be an update on a planned funding call with the DICE network.</li> </ul> </li> <li>• SG to consider preparing a statement in future explaining why they did or did not carry out activities around environmental sustainability. <ul style="list-style-type: none"> <li>○ In progress. See agenda item 2 below.</li> </ul> </li> <li>• ML to schedule the next meeting of the AB. <ul style="list-style-type: none"> <li>○ Complete.</li> </ul> </li> </ul> |  |  |
| 2 | <p>Update on what has been done since the last meeting and what is next for pro<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Theme 2 project update: MakeDevice<br/>SHo explained that the Theme Two funding call was the first to be organised by the network and focused on device scaling and replication. It resulted in three projects, including one called REPLICATE which is based at Lancaster</li> </ul>   |  |  |

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|  | <p>University. It is focused on expanding the MakeDevice web app and is currently coming to a close in October 2025. MakeDevice works with the Micro:bit and Jascad components which allow people to quickly and easily prototype devices. They can then use the MakeDevice software to refine the prototype for scaling. It is essentially a PCB design tool that does not require any specialist knowledge. The design files can be sent to a PCB manufacturer to have custom PCBs printed. The REPLICATE project team is planning to run an extended pilot with members of the pro<sup>2</sup> network. This is partly a user study to gather data for research and partly to support the network's mission of democratising hardware. The other two projects which received funding from the Theme Two call have not finished yet as they started late due to recruitment delays.</p> <p>Comments:</p> <p>TM asked where to direct people who want to know more about MakeDevice. SHo said there is <a href="#">a TEI paper</a> explaining the early work on MakeDevice and there will be a new TEI paper coming out soon. People can also learn more about the REPLICATE project on the pro<sup>2</sup> website, in the <a href="#">Showcase section</a>.</p> <ul style="list-style-type: none"><li>• Theme 1 project engagement</li></ul> <p>SHo described the latest round of funded projects resulting from the Theme One call, which focus on novel materials and unconventional devices. In order to main more contact with the funded project teams, the SG recently asked the PI (<a href="#">Yi Wang</a>, U. of Birmingham) of one of the new Theme One projects called 'Liquid in Circuits' to give a talk on his research at a SG meeting. The work involves using liquid metal to make stretchable, robust circuits which are useful for applications like wearable electronics. The presentation to the SG described the funded research and the use of liquid metals for devices more widely. The SG are interested in holding talks like these more publicly, to raise awareness of interesting topics aligned with the pro<sup>2</sup> mission. SHo asked the AB for recommendations of topics that would work well for future talks and</p> |  |  |
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|  | <p>connections to those who might be interested in attending.</p> <p>Comments:</p> <p>The AB was supportive of the idea of holding similar talks publicly for awareness raising and noted that talks could potentially result in opportunities for innovation and collaboration. TM's colleague would be very interested in Yi Wang's work.</p> <p>JD said Innovate UK could be a good link between pro<sup>2</sup> and organisations that work in areas like flexible electronics. GP also recommended <a href="#">Konfer</a> as a platform for sharing these talks in future. She also recommended the <a href="#">Enterprise Europe Network</a> for more international collaborations, noting that her team could help pro<sup>2</sup> develop a profile on that network.</p> <p>TM asked whether talks and other work like this are being documented for capturing impact. MF said yes, the management team capture data like this for impact monitoring.</p> <p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>• TM to connect his colleague with Yi Wang.</li> <li>• SHu to further discuss with GP the possibility of pro<sup>2</sup> developing a profile on the Enterprise Europe Network.</li> <li>• Summer school 2025 and 2026</li> </ul> <p>SHo reported on the 2025 summer school stating that it was similar in format to 2024. It was very inclusive of a diverse group of people, including all levels of experience and open to people who had made a prototype as well as those who only had an idea for one. The 2025 summer school built on the previous year's success, with more attendees (40 in 2025 vs about 30 in 2024). The event was still heavily subsidised by the network, but also allowed a few attendees who did not receive a subsidised place to pay the full fee of £400 in order to attend. Those who received a subsidised place paid only £50 for the event, including accommodation, food, and content. SHo reviewed the 2025 feedback and felt it was even more positive than 2024. The event was</p> | <p>19/12/25</p> <p>26/11/25</p> | <p>TM</p> <p>SHu</p> |
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|  | <p>advertised more widely in 2025, including in Europe. For 2026, SHo is hoping to advertise more internationally. He is aiming for a similar event in 2026 in terms of size and content, but would like to offer more opportunities for networking and peer-to-peer working in 2026. There were a few return attendees in 2025 who came primarily for networking reasons.</p> <p>Comments:</p> <p>TM asked if the returnees were offered anything special or asked to contribute. SHo said some new content was offered, and that some of the 2024 cohort were asked to come back as speakers, including two who ran tutorial sessions. This helped build confidence in the learning.</p> <p>LEH said two of his students attended and loved the event, they felt the networking aspect was very important. TM agreed the event was a success and that the learning and networking opportunities were both very important.</p> <p>TM asked if there was an alumni network for the summer schools. SHo said there is a WhatsApp community so the conversation can carry on outside the summer school. GP recommended establishing a LinkedIn group for alumni, noting these can be very effective for small groups and do not require much curating. She said they can be a great resource for tracking attendees' career progress and future work.</p> <p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>• ML to establish a LinkedIn Group for summer school attendees.</li> <li>• Pre-CHI event and Open Source Hardware Summit</li> </ul> <p>MF said the network sponsored the SWUK Pre-CHI event in April 2025 which took place at the University of Bristol. The event is for academics in Human Computer Interaction who want to attend a local event as an alternative to the main CHI conference or for early career researchers (ECRs) to practice their presentation skills ahead of the main conference. Pre-CHI had a lot of PhD students and postdocs attending (about 80 people in</p> | 19/12/25 | ML |
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|  | <p>total). The network is looking to support another SWUK Pre-CHI in 2026. RC held a workshop at Pre-CHI around challenges and solutions in device manufacturing which was useful to gather data for his research, as he learned more about the kind of work being done in the community. MF noted that he is seeing an increasing number of people designing for manufacture rather than designing for prototyping which was interesting; previously this group in HCI was handing over the design for manufacture challenge to industry, but MF said it was great to see ECRs showing an interest in this.</p> <p>MF said pro<sup>2</sup> sponsored and attended the Open Source Hardware (OSHW) Summit in May in Edinburgh. Sponsorship was provided at the 'enthusiast' level. The attendees were primarily makers and very politically engaged, much more so than at other conferences MF has attended. He felt they were very committed to being open source in both political and technical ways. MF said people challenged the network somewhat around its politics and mission which was great, and that there was a lot of engagement with pro<sup>2</sup> in general. The network handed out pro<sup>2</sup> branded chocolate bars designed by Matt Sutton which were popular. MF felt the OSHW community were very useful to engage with, to help the network understand what kind of work is being done in that space.</p> <p>Comments:</p> <p>TM asked if people are getting the whole device journey from conversations that took place at these events, or if some parts like isotyping are left out. MF said many people see the full manufacturing journey as a huge barrier, believing the entire process is too difficult, but isotyping breaks the challenge down into smaller steps that motivate some people. MF said some people see engaging with manufacturing as an intellectual exercise, which helps them become more applied in their work. Isotyping provides an intellectual challenge around scaling that helps bring academics along into thinking more about this issue.</p> <p>LEH asked how many people attended the OSHW Summit. MF said there were about 300</p> |  |  |
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|  | <p>people in attendance. LEH said it is similar to the Sketching in Hardware event in terms of scope (however Sketching is about 40 delegates), and SHo noted that they are different in terms of content and political outlook.</p> <ul style="list-style-type: none"> <li>• BOMNADO</li> </ul> <p>MF explained that BOMNADO was created by a network member called Hardy &amp; Ellis Inventions, which are based in Manchester. They created it as a tool to manage their own Bill of Materials (BOM). The pro<sup>2</sup> team visited them in June to see how they're using the tool and to learn more about it. They use it to manage things like packaging and other aspects of products beyond BOM. MF said it is a very comprehensive tool to help reproduce designs and has helped Hardy &amp; Ellis improve their efficiency. They have offered to gift the software to pro<sup>2</sup> under an open licence. The network will hire a software engineer for a period of one year to help improve BOMNADO and make it accessible to a wider community. The network has been granted permission by the University of Bristol to hire an engineer and will begin recruiting soon. The software is very usable already but needs some refinement. RC will work on case studies to test the final product before it goes into wider use. MF said the commercial model to keep BOMNADO going sustainably has not been decided yet, but may be a university spinout of some kind. The SG will develop a plan for this in the next few months. MF said there has been demand from the pro<sup>2</sup> community for a tool like BOMNADO. He explained that there will be a demo for the AB when BOMNADO is in a more usable state, noting it cannot be done currently given that it still contains Hardy &amp; Ellis proprietary data.</p> <p>Comments:<br/>The AB felt that this was a worthwhile project to support and expressed interest in viewing a BOMNADO demo when it is ready.</p> <ul style="list-style-type: none"> <li>• Residency scheme update</li> </ul> <p>MF explained that the pro<sup>2</sup> Residency Scheme is a funding call open on a rolling basis to support people visiting partners in the UK or to support UK-based researchers visiting international</p> |  |  |
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|  | <p>partners; in either case a UK institution is awarded the funding. The network has funded three thus far, the most recent of which is a collaboration between Imperial and MIT on haptics hardware dependent on material jamming. MF said the network has not had many applications so far and not all of the applications received have been awarded funding. The SG would like to receive more applications to the scheme in future and are looking to renew the promotion of the scheme to garner more interest. The network is open to recommendations from the AB for further dissemination.</p> <p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>• AB members to share any further recommendations of channels for promoting the Residency Scheme.</li> <li>• Joint call with the DICE network+ MF said the network is aiming to hold a joint funding call in the spring of 2026 with the DICE network+ based at Exeter. The two networks will jointly fund projects, although the mechanism for doing this is still being discussed. MF said it has been difficult due to funder constraints and institutional processes. The funding will support work on challenges aligned with DICE and pro<sup>2</sup> missions, mainly around devices to support a circular economy and improving the sustainability of devices. The SG considered working on a sustainability paper with DICE but this does not seem to be in scope for DICE given the amount of work they are already committed to. MF feels that the joint call will result in useful outputs and will look to work with DICE further in the future.</li> </ul> <p><b>Comments:</b></p> <p>TM said DICE would be a useful partner as they are very well connected. MF agreed, noting that he attended their launch event and appreciated the breadth of engagement with DICE.</p> <ul style="list-style-type: none"> <li>• Away day - funding focus</li> </ul> <p>The SG held their first in-person away day in the spring of 2025 in Nottingham and will hold another in November. The discussion for the next away day will focus on funding opportunities for future iterations of pro<sup>2</sup> and</p> | 19/12/25 | AB |
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|   | <p>potential spin off projects. The SG is interested in both UK and European funding opportunities, as well as seeking potential European partners who are doing interesting work aligned with the pro<sup>2</sup> mission. MF said that the diversity of industry and industrial regulation in other countries is of interest to the network. He reported that the network is also in the first stage of a programme grant discussion with EPSRC now.</p> <p>Comments:<br/>There were no comments on this topic.</p> <ul style="list-style-type: none"> <li>Staffing updates</li> </ul> <p>MF said that Lorraine Underwood had finished her secondment as a SG member, filling in for Joe Finney who was on sabbatical. Joe has returned to his role as a SG member now and Lorraine remains engaged with the pro<sup>2</sup> team. RC will be with pro<sup>2</sup> until the end of the network now. ML is currently working half time for pro<sup>2</sup> while doing a secondment until the end of February 2026. A new administrator, Anna Balbuena Blengeri is supporting the network during this period. SHu is going on a career break in December and January with ML filling in for her whilst she is away. MF said that the team is very stable overall.</p> <p>Comments:<br/>TM agreed that the staffing for pro<sup>2</sup> sounded very stable, adding that he was pleased to hear this.</p> |  |  |
| 3 | <p>Research Associate work programme overview</p> <p>MF gave an overview of RC's work as he was unable to attend the meeting. RC has been contacting industry and academic network partners for long-form interviews around challenges and solutions. These are informing a wider report RC is writing, with an aim to publish toward the end of the network. The report will be organised around the network's themes and will seek to capture the challenge and solution space the network is working in, alongside data from our funded projects and events. It will include a gap analysis to see where pro<sup>2</sup> is not addressing challenges, to determine what future work is needed to get people from prototype to product. RC's</p>  |  |  |

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|   | <p>interviews are also helping to keep members engaged with the network.</p> <p>RC is also working on a study of the Access:bit, an accessibility add on to the BBC Micro:bit. SHo said the Microbit Learn to Code device is very popular globally and great for engaging people of all genders, but the developers would like to make it more accessible to people with disabilities. The current Micro:bit has a small display and small buttons making it difficult for some people with disabilities to work with. A device called the Access:bit has been developed to allow the connection of access switches which enable people with certain disabilities to engage with it. SHo said that ordering the Access:bit is currently difficult for people as there are a lot of technical questions involved. A study which RC has contributed to has been conducted around creating and testing instructions for ordering an Access:bit. This research will improve the ordering process for both users and the manufacturer. Another update on this study will be given at the next AB meeting.</p> <p>Comments:<br/>The AB said that it seemed that RC was very busy and felt that he was doing interesting work.</p> |  |  |
| 4 | <p>AOB</p> <ul style="list-style-type: none"> <li>• Steve awarded Mountbatten Medal MF and the advisory board congratulated SHo on winning the prestigious IET Mountbatten Medal for his contributions to the BBC Micro:bit which have benefitted children's education in technology.</li> <li>• In person meeting in April</li> </ul> <p>TM asked when and where the next meeting of the AB would take place. SHu said that most of the AB members had now responded to the poll to determine availability for the meeting, and that it would take place in April 2026. She said the location had not been determined yet, as she is conscious that the AB is spread widely across the UK. She asked if the AB members would be willing to travel and if there is a location that would work best for everyone, such as Bristol, London, or somewhere more centrally located. TM said that Bristol might be</p>  |  |  |

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|  | <p>the easiest in terms of organising logistics for the day and would allow the AB to see the network's outputs. His preference would be Bristol, then London, and then elsewhere. Other AB members agreed with this. SHu said there would be branded Tony Choclonely bars for those attending. She added that it could be a half day event, including a meal and showcasing the funded projects. LEH thought this would be nice, as some of the funded projects are based in Bristol and Bath. Other AB members agreed a half day would be good, around the middle of the day (e.g. hold the AB meeting, then have lunch, and then showcase the network outputs). This would allow some members to travel to Bristol in the morning rather than needing to arrive the day before.</p> <p>SHu asked where the AB were physically based. The AB responded with: TM Cambridge, JD Swindon, LEH Nottingham, GP Chippenham, MGT Cardiff, SF Leeds. TM said SC may be in Dorset or Bath (SC splits his time between both).</p> <p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>• SC and SF to complete the poll with their availability for an in person meeting in April 2026.</li> <li>• LEH's funded project featured in magazine</li> </ul> <p>LEH said he has been written about in a Swedish magazine, on the topic of prototyping. <a href="#">The article</a> shows a picture of prototypes related to his pro<sup>2</sup> funded project. SHo said the project LEH is leading is very interesting and expressed an interest in hearing more from him about it in the future.</p> | 21/11/25 | SC, SF |
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